AMENDMENTS TO THE CLAIMS

Please cancel claims 1-38 and 68-72; amend claims 53 and 58; and add claims 73-77 as follows:

1. - 38. (Cancelled)

39. (Original) A method for manufacturing a magnetic memory element comprising:

forming a pinned or reference layer with a magnetization in a first direction over a substrate;

forming a tunnel barrier layer over the pinned layer; and

forming a sense layer over the tunnel barrier layer, said sense layer having a first and second ferromagnetic layer separated by a spacer layer and a characteristic which results in stray field coupling and antiferromagnetic exchange coupling between said first and second ferromagnetic layers.

40. (Original) A method of claim 39 wherein the act of forming said sense layer further comprises:

forming said first magnetization layer over the tunnel barrier layer;

forming a spacer layer over the first magnetization layer; and

forming the second magnetization layer over the spacer layer.

41. (Original) A method of claim 40 further comprising smoothing a surface of the pinned layer before forming another layer on said pinned layer.

42. (Original) A method of claim 40 further comprising smoothing the first magnetization layer before forming a spacer layer.

43. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising NiFe.

44. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising CoFe.

45. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising Co.

46. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising Fe.

47. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising Ni

48. (Original) A method of claim 40 wherein said first and second magnetizable layers are formed of a material comprising NiFeCo.

49. (Original) A method of claim 40 wherein said spacer layer comprises a Ru layer.

50. (Original) A method of claim 40 wherein said spacer layer comprises a Cu layer.

51. (Original) A method of claim 40 wherein said spacer is a conductor that is not ferromagnetic or antiferromagnetic.

52. (Original) A method of claim 40 wherein said spacer layer is formed with a thickness such that the antiferromagnetic exchange coupling between said first and second magnetizable layers is less than the coercive (H) field value of the one of the first or second magnetizable layer which has the largest coercive field value.

53. (Currently Amended) A method of claim 40 where forming said layers is such that the layers are formed of a material and thickness sufficient to provide stray field coupling and antiferromagnetic exchange coupling, said antiferromagnetic exchange coupling is within the range of greater than 0 to <= 300 Oe between the first and second layers across said spacer layer.

54. (Original) A method of claim 40 wherein said step of forming the first and second magnetization layers includes forming said first and second layers including NiFe.

55. (Original) A method of claim 40 wherein second layer is formed with a thickness t and first layer is formed with a thickness greater than t.

56. (Original) A method of claim 40 further comprising:

forming a thinner layer, relative to the first magnetizable layer, of Co interposed between the spacer layer and the first magnetizable layer; and

forming a thinner layer, relative to the second magnetizable layer, of Co interposed between the spacer layer and the second magnetizable layer.

57. (Original) A sense layer of claim 40 further comprising:

forming a thinner layer, relative to the first magnetizable layer, of CoFe interposed between the spacer layer and the first magnetizable layer; and

forming a thinner layer, relative to the second magnetizable layer, of CoFe interposed between the spacer layer and the second magnetizable layer.

58. (Currently Amended) A method for manufacturing a magnetic memory element comprising:

forming a sense layer over a substrate, said sense layer having a first and second ferromagnetic layer separated by a spacer layer and a characteristic which results in stray field coupling and antiferromagnetic exchange coupling between said first and second ferromagnetic layers across said spacer layer;

forming a tunnel barrier layer over the sense layer; and

forming a pinned or reference layer with a magnetization in a first direction over ~~a~~ said tunnel barrier.

59. (Original) A method of claim 58 wherein the act of forming said sense layer further comprises:

forming said first magnetization layer over the tunnel barrier layer;

forming a spacer layer over the first magnetization layer; and

forming the second magnetization layer over the spacer layer.

60. (Original) A method of claim 58 wherein said spacer layer is formed with a thickness such that the antiferromagnetic exchange coupling between said first and second magnetizable layers is less than the coercive (H) field value of the one of the first or second magnetizable layer which has the largest coercive field value.

61. (Original) A method of claim 58 where forming said layers is such that the layers are formed of a material and thickness sufficient to provide stray field coupling and antiferromagnetic exchange coupling, said antiferromagnetic exchange coupling is greater than 0 and <= 200 Oe between the first and second layers across said spacer layer.

62. (Original) A method of claim 58 wherein second magnetizable layer is formed with a thickness t and first magnetizable layer is formed with a thickness greater than t.

63. (Original) A method for manufacturing a magnetic memory element comprising:

forming a pinned or reference layer with a magnetization in a first direction over a substrate;

smoothing a surface of the pinned layer;

forming a tunnel barrier layer over the pinned layer; and

forming a sense layer over the tunnel barrier layer, said act of forming said sense layer comprising:

forming said first magnetization layer over the tunnel barrier layer;

smoothing the first magnetization layer;

forming a spacer layer over the first magnetization layer;

forming a second magnetization layer over of the spacer layer;

said first and second magnetization layers and spacer layer being formed such that said layers are stray field coupled and antiferromagnetic exchange coupled across said spacer layer;

said first and second magnetizable layer are formed having a magnetic saturation times said first layer's thickness which is not equal to said second layer's magnetic saturation times second layer thickness of the second magnetizable layer.

64. (Original) A method of claim 63 wherein said spacer layer is formed with a thickness such that the antiferromagnetic exchange coupling between said first and second magnetizable layers is less than the coercive (H) field value of the one of the first or second magnetizable layer which has the largest coercive field value.

65. (Original) A method of claim 63 wherein sense layer is formed having antiferromagnetic exchange coupling between first and second

magnetization layer of more than zero and less than a value which prevents magnetic orientation switching of said sense layer in the presence of an applied magnetic field.

66. (Original) A method of claim 63 wherein said first magnetization layer, spacer layer and second magnetization layer are formed of materials and thickness' sufficient to provide stray field coupling and antiferromagnetic exchange coupling between said first and second magnetizable layers and across said spacer layer, said antiferromagnetic exchange coupling is greater than 0 <= 200 Oe.

67. (Original) A method of claim 63 wherein the second magnetization layer is formed with a thickness t and first layer is formed with a thickness greater than t.

68 – 72 (cancelled)

73. (New) A method for manufacturing a magnetic memory element comprising:

forming a pinned or reference layer with a magnetization in a first direction over a substrate;

forming a conductive layer over the pinned layer for creating a giant magnetoresistance effect; and

forming a sense layer over the conductive layer, said sense layer having a first and second ferromagnetic layer separated by a spacer layer and a characteristic which results in stray field coupling and antiferromagnetic exchange coupling between said first and second ferromagnetic layers.

74. (New) A method of claim 73, wherein the act of forming said sense layer further comprises:

forming said first magnetization layer over the conductive layer;

forming a spacer layer over the first magnetization layer; and

forming the second magnetization layer over the spacer layer.

75. (New) A method of claim 73, wherein forming said layers is such that the layers are formed of a material and thickness sufficient to provide stray field coupling and antiferromagnetic exchange coupling, said antiferromagnetic exchange coupling is within the range of greater than 0 to <= 300 Oe between the first and second layers across said spacer layer.

76. (New) A method of claim 73, wherein second layer is formed with a thickness t and first layer is formed with a thickness greater than t.

77. (New) A method of claim 73, wherein said pinned or reference layer is a synthetic ferrimagnet.